CATERPILLAR

Service Manual

385C L EXCAVATOR

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Product: EXCAVATOR
Model: 385C L EXCAVATOR SBE
Configuration: 385C L Excavator SBE00001-UP (MACHINE) POWERED BY C-18 Engine

Disassembly and Assembly
C15 and C18 Engines for Caterpillar Built Machines
Media Number -RENR8261-23 **Publication Date -01/08/2015** **Date Updated -01/08/2017**

i06791558

Alternator - Remove and Install

SMCS - 1405-010

Removal Procedure

WARNING

Personal injury can result from failure to disconnect the battery.

First, disconnect the negative battery cable. Then, disconnect the positive battery cable.

A positive power lead can cause sparks if the battery is not disconnected. Sparks can possibly result in battery explosion or fire.

1. Disconnect the batteries.
2. Remove the alternator belt.
3. Place identification marks on all of the harness assemblies.

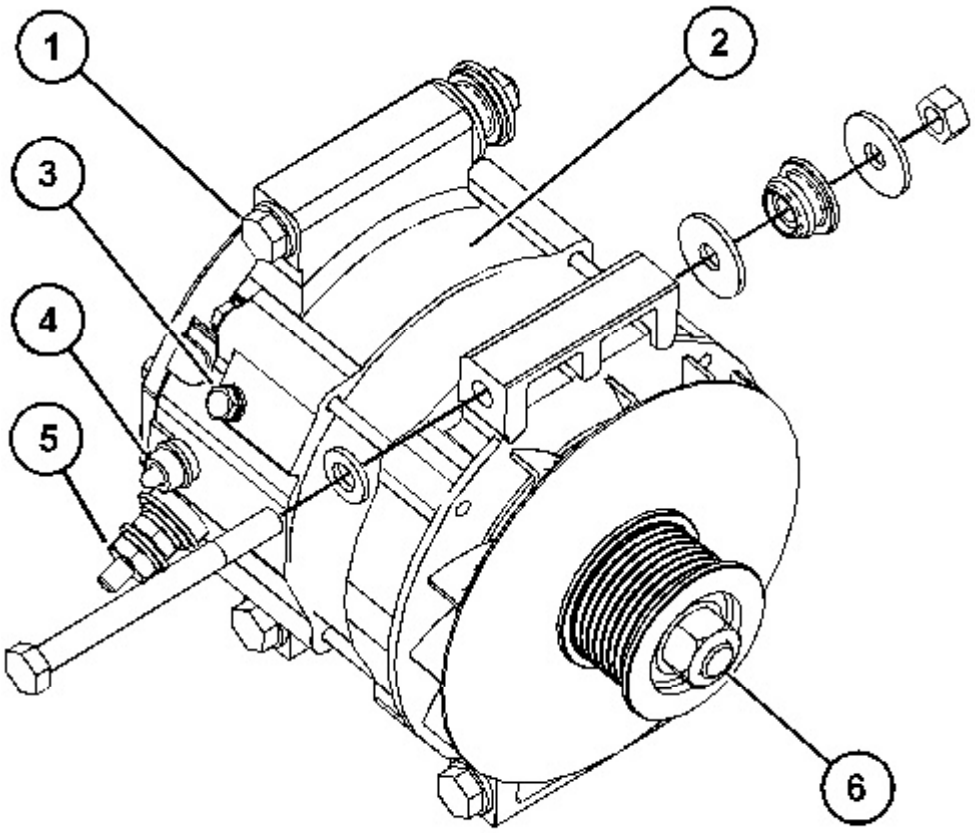

Illustration 1 g06116692

4. Disconnect the harness assemblies from terminal (4) and terminal (5).
5. Remove bolt (3) and the harness assembly from alternator (2).
6. Remove bolts (1). Remove alternator (2).
7. If necessary, remove nut (6) and remove the pulley from the alternator.

Installation Procedure

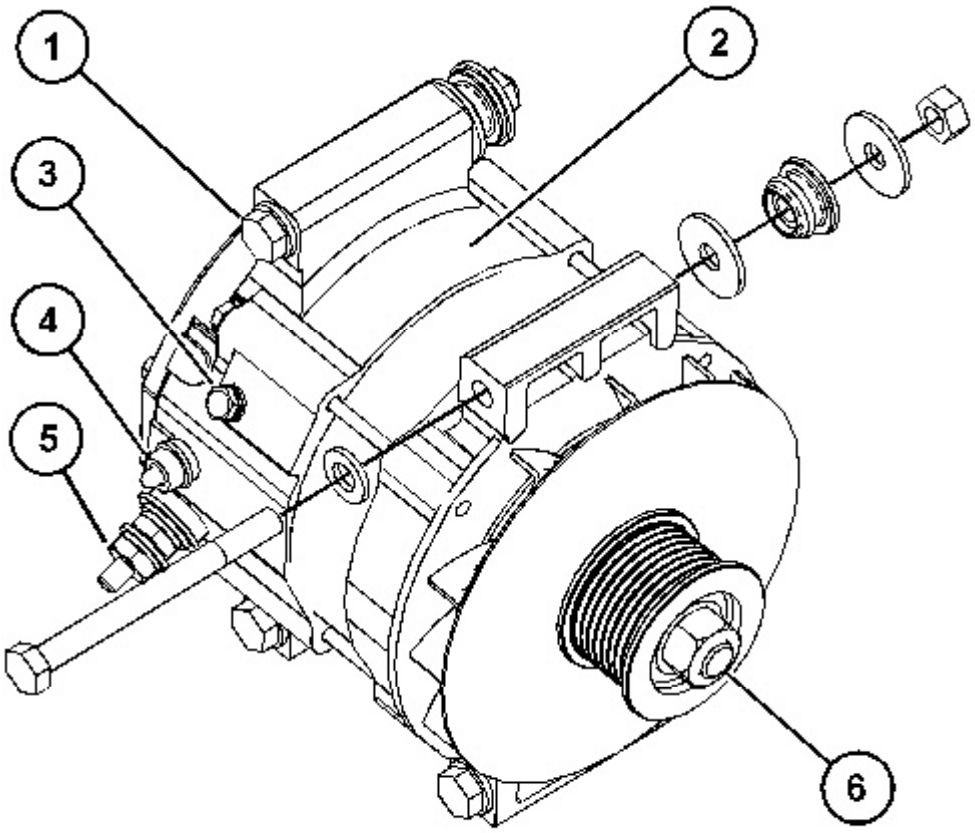

Illustration 2 g06116692

1. If necessary, install the pulley on alternator (2). Install nut (6). Tighten the nut to a torque of 127 ± 10 N·m (94 ± 7 lb ft).
2. Position alternator (2) on the alternator mounting bracket. Install bolts (1).
3. Connect the harness assembly to alternator (2) and install bolt (3). Tighten the bolt to a torque of 4.4 ± 1.0 N·m (39 ± 9 lb in).
4. Connect the harness assembly to terminal (5). Tighten the nut to a torque of 18 ± 2 N·m (13 ± 2 lb ft).
5. Connect the harness assembly to terminal (4).
6. Install the alternator belt.
7. Connect the batteries.

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Product: EXCAVATOR
Model: 385C L EXCAVATOR SBE
Configuration: 385C L Excavator SBE00001-UP (MACHINE) POWERED BY C-18 Engine

Disassembly and Assembly
C15 and C18 Engines for Caterpillar Built Machines
Media Number -RENR8261-23 **Publication Date -01/08/2015** **Date Updated -01/08/2017**

i02212192

Atmospheric Pressure Sensor - Remove and Install

SMCS - 1923-010

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

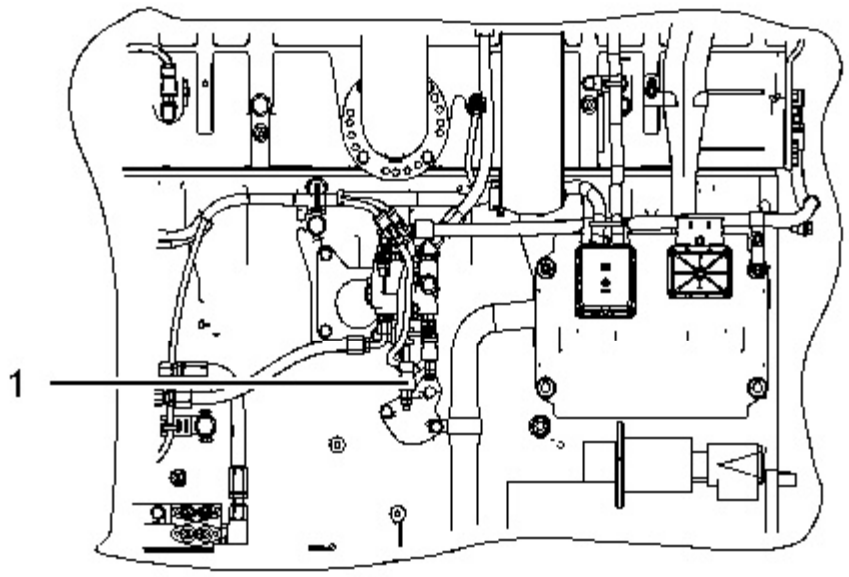

Illustration 1 g01116929

(1) Atmospheric pressure sensor ... 10 ± 2 N·m (89 ± 18 lb in)

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i05977048

Bearing Clearance - Check

SMCS - 1203-535; 1219-535

Measurement Procedure

Table 1

Required Tools			
Tool	**Part Number**	**Part Description**	**Qty**
A	198-9142	Plastic Gauge (Green) 0.025 to 0.076 mm (0.001 to 0.003 inch)	1
	198-9143	Plastic Gauge (Red) 0.051 to 0.152 mm (0.002 to 0.006 inch)	1
	198-9144	Plastic Gauge (Blue) 0.102 to 0.229 mm (0.004 to 0.009 inch)	1
	198-9145	Plastic Gauge (Yellow) 0.230 to 0.510 mm (0.009 to 0.020 inch)	1

Note: Plastic gauge may not be necessary when the engine is in the chassis.

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

Note: Cat does not recommend the checking of the actual bearing clearances particularly on small engines. This is because of the possibility of obtaining inaccurate results and the possibility of damaging the bearing or the journal surfaces. Each Cat engine bearing is quality checked for specific wall thickness.

Note: The measurements should be within specifications and the correct bearings should be used. If the crankshaft journals and the bores for the block and the rods were measured during disassembly, no further checks are necessary. However, if the technician still wants to measure the bearing clearances, Tooling (A) is an acceptable method. Tooling (A) is less accurate on journals with small diameters if clearances are less than 0.10 mm (0.004 inch).

NOTICE

Lead wire, shim stock or a dial bore gauge can damage the bearing surfaces.

The technician must be very careful to use Tooling (A) correctly. The following points must be remembered:

- Ensure that the backs of the bearings and the bores are clean and dry.
- Ensure that the bearing locking tabs are properly seated in the tab grooves.
- The crankshaft must be free of oil at the contact points of Tooling (A).

1. Put a piece of Tooling (A) on the crown of the bearing that is in the cap.

   Note: Do not allow Tooling (A) to extend over the edge of the bearing.

2. Use the correct torque-turn specifications in order to install the bearing cap. Do not use an impact wrench. Be careful not to dislodge the bearing when the cap is installed.

   Note: Do not turn the crankshaft when Tooling (A) is installed.

3. Carefully remove the cap, but do not remove Tooling (A). Measure the width of Tooling (A) while Tooling (A) is in the bearing cap or on the crankshaft journal. Refer to Illustration 1.

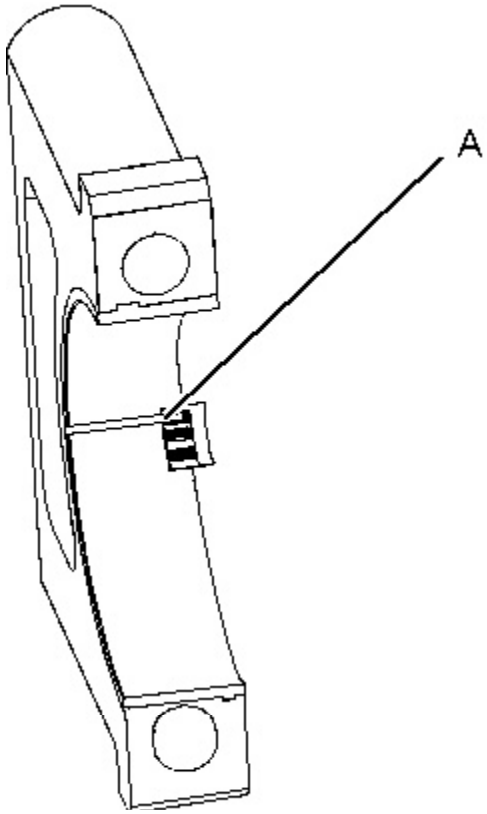

Illustration 1 g01152855

Typical Example

4. Remove all of Tooling (A) before you install the bearing cap.

   Note: When Tooling (A) is used, the readings can sometimes be unclear. For example, all parts of Tooling (A) are not the same width. Measure the major width in order to ensure that the parts are within the specification range. Refer to Specifications Manual, "Connecting Rod Bearing Journal" and Specifications Manual, "Main Bearing Journal" for the correct clearances.

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Disassembly and Assembly
C15 and C18 Engines for Caterpillar Built Machines
Media Number -RENR8261-23 **Publication Date -01/08/2015** **Date Updated -01/08/2017**

i02211291

Camshaft - Install

SMCS - 1210-012

Installation Procedure

Table 1

Required Tools			
Tool	**Part Number**	**Part Description**	**Qty**
A	9U-7257	Cradle	1
B	9U-7256	Guide	1
C	9U-7225	Camshaft Pilot	2
D	9U-7240	Camshaft Hook	2
H	9U-7243	Alignment Sleeve	1
J	8T-2998	Lubricant	1
K	9S-3263	Thread Lock Compound	1

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

NOTICE

Do not turn the crankshaft or the camshaft while the camshaft gear is removed. If the front gear group is not correctly timed during installation, interference can occur between the pistons and the valves, resulting in damage to the engine.

NOTICE

Care must be used when removing or installing the camshaft. Do not damage the finshed surfaces of the camshaft or the camshaft bearings.

1. Ensure that the camshaft and camshaft bearings are thoroughly clean. Lubricate the camshaft lobes with a 50/50 mixture of Tooling (J) and clean engine oil. Apply a thin coat of clean engine oil on the camshaft bearings.

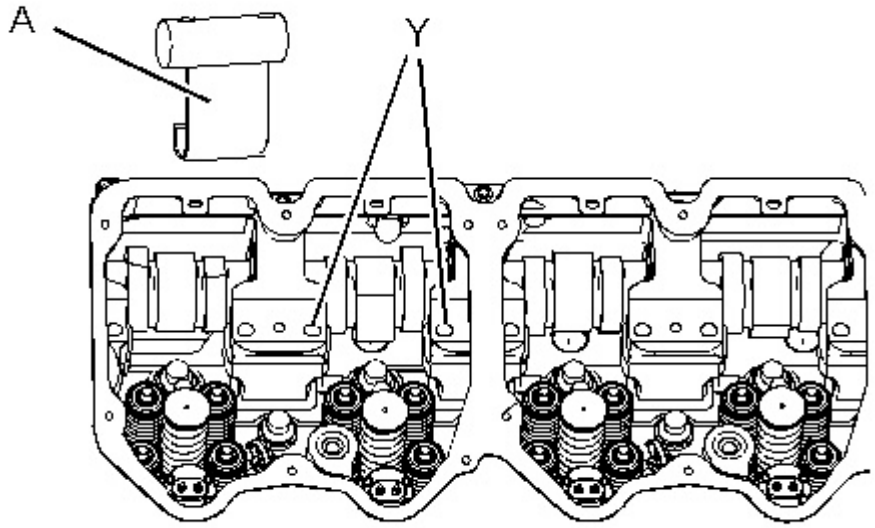

Illustration 1 g01056704

2. Install Tooling (A) on the cylinder head at Location (Y).

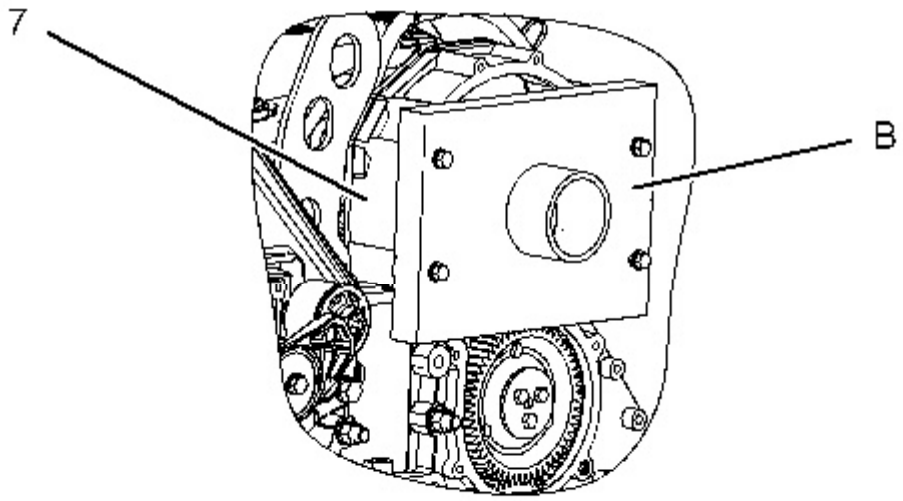

Illustration 2 g01056901

3. Install Tooling (B) on front housing (7). Do not tighten the bolts that hold Tooling (B) to front housing (7) at this time.
4. Use Tooling (H) to align Tooling (B) with the camshaft bearings. Tighten the bolts that hold Tooling (B) to front housing (7). Remove Tooling (H).

   Note: Tooling (H) should move freely from the bore of Tooling (B).

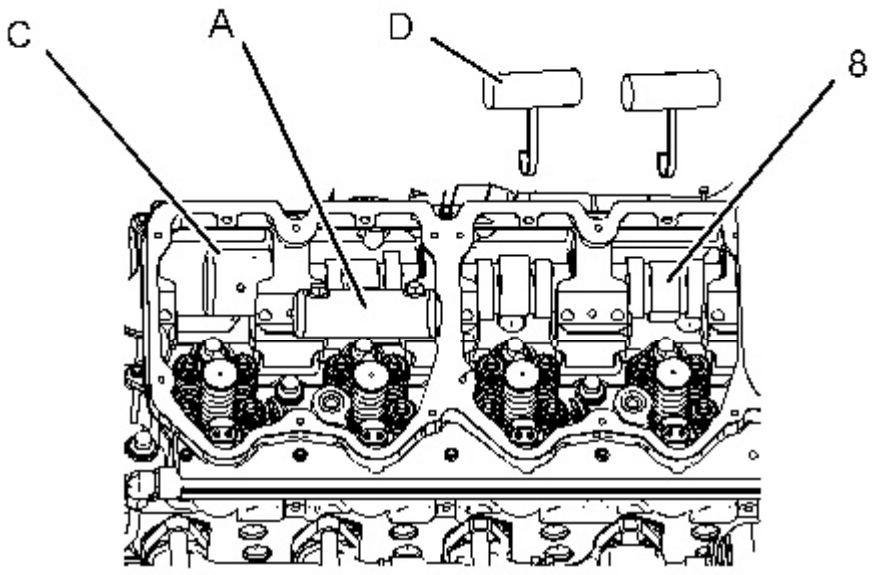

Illustration 3 g01047961

5. Install Tooling (C) on the rear of the camshaft.

6. Use two technicians to install the camshaft. Use Tooling (D) to assist in aligning camshaft (8) with the camshaft bearings. Carefully slide the camshaft into the cylinder head from the front of the engine. Keep the camshaft level while the camshaft is being installed in the cylinder head. The weight of the camshaft is approximately 39 kg (86 lb).

   Note: Rotate the camshaft during installation. This will prevent the camshaft from binding in the camshaft bearings.

7. Remove Tooling (C) and finish installing camshaft (8) in the bore.

   Note: Tooling (C) must be removed before the camshaft can be completely installed in the cylinder head.

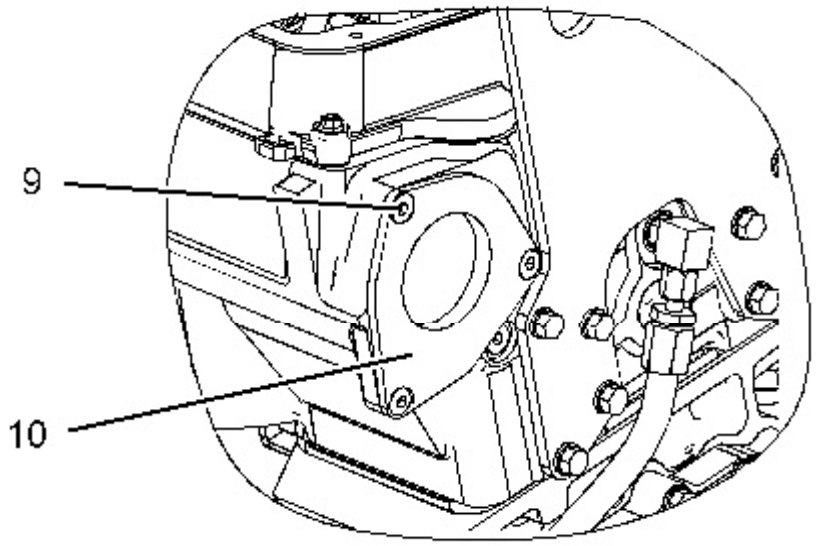

Illustration 4 g01056675

8. Install the O-ring seal on cover (10). Position the cover on the rear of the cylinder head. Install flat head screws (9) and tighten to a torque of 13 ± 3 N·m (10 ± 2 lb ft).

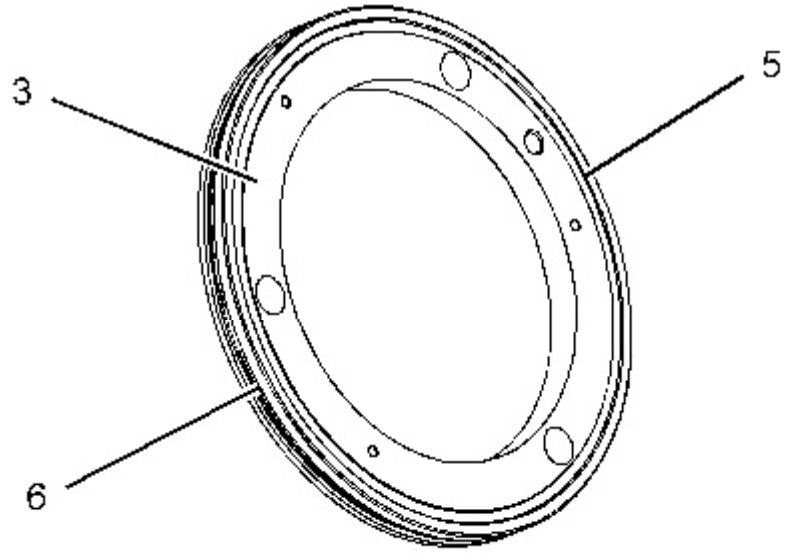

Illustration 5 g01056684

9. Install O-ring seal (5) and O-ring seal (6) in sealing plate (3). Lubricate O-ring seal (6) with a 50/50 mixture of Tooling (J) and clean engine oil.

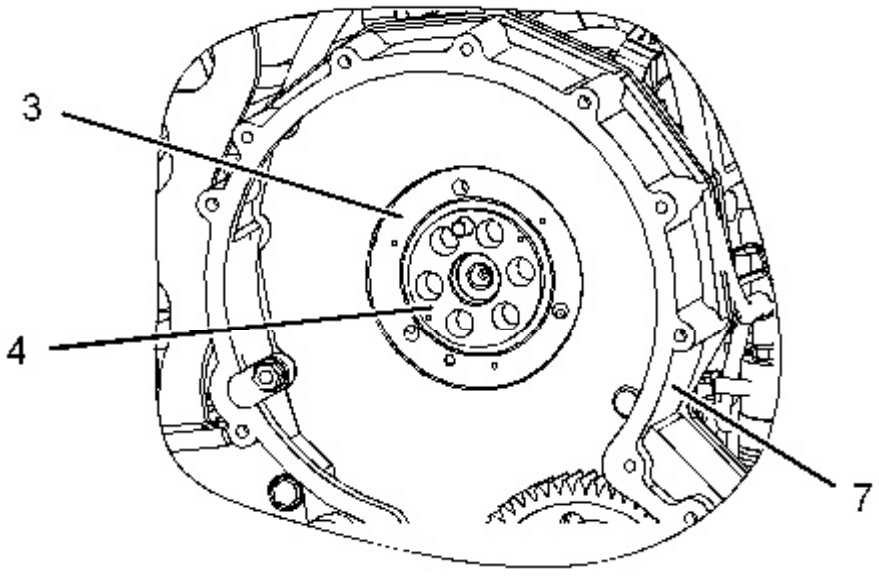

Illustration 6 g01056682

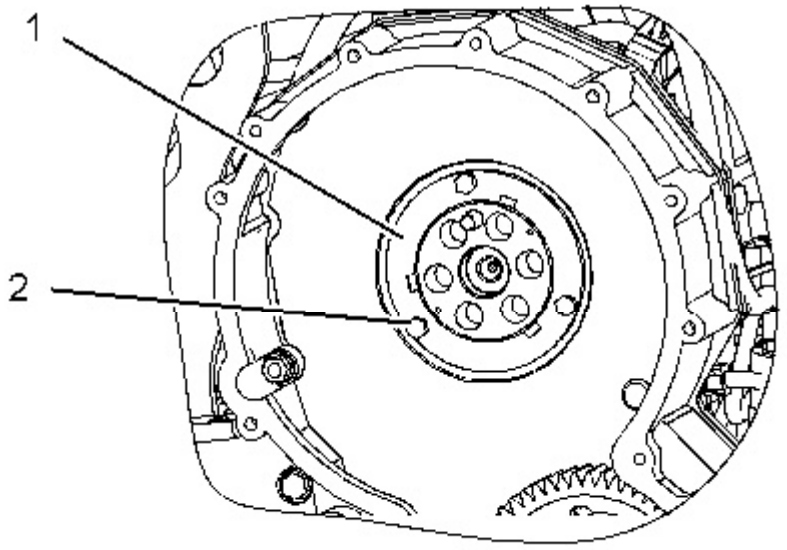

Illustration 7 g01056681

10. Install sealing plate (3) in front housing (7). Install adapter assembly (4) in the sealing plate. Ensure that the dowel in adapter assembly (4) engages the hole in the camshaft.

11. Install thrust plate (1) . Apply Tooling (K) to bolts (2). Hold the thrust plate in position and install bolts (2). Evenly tighten bolts (2) until sealing plate (3) and the O-ring seal are seated against the cylinder head.

    Note: Ensure that the O-ring seal stays in the groove in sealing plate (3).

End By:

a. Install the rocker arms and the rocker shafts. Refer to Disassembly and Assembly, "Rocker Arms and Shaft - Install".

b. Install the camshaft gear. Refer to Disassembly and Assembly, "Camshaft Gear - Remove and Install".

Alternative Installation Procedure

Table 2

Required Tools			
Tool	**Part Number**	**Part Description**	**Qty**
E(1)	177-8001	Sleeve	1
F	177-8002	Adapter	1
G	6L-4697	Bolts	3
J	8T-2998	Lubricant	1

K	9S-3263	Thread Lock Compound	1

(1) Part of **177-8003** Engine Tool Group

Note: This is an optional procedure to install the camshaft. The preceding tool list shows the required tooling for installing the camshaft from the front of the engine or the rear of the engine.

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

NOTICE

Do not turn the crankshaft or the camshaft while the camshaft gear is removed. If the front gear group is not correctly timed during installation, interference can occur between the pistons and the valves, resulting in damage to the engine.

NOTICE

Care must be used when removing or installing the camshaft. Do not damage the finshed surfaces of the camshaft or the camshaft bearings.

1. Ensure that the camshaft and camshaft bearings are thoroughly clean. Lubricate the camshaft lobes with a 50/50 mixture of Tooling (J) and clean engine oil. Apply a thin coat of clean engine oil on the camshaft bearings.

2. To install the camshaft from the rear of the engine, go to Step 3 through Step 5. To install the camshaft from the front of the engine, go to Step 6 through Step 8.

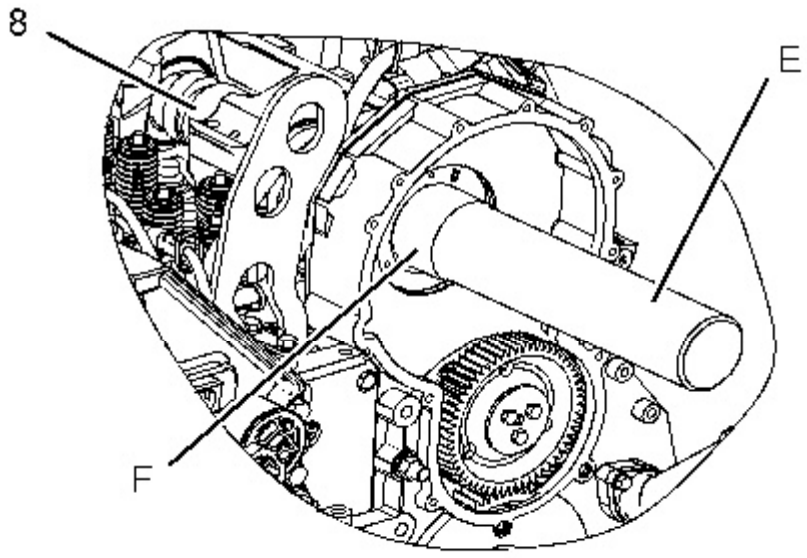

Illustration 8 g01056714

Install the camshaft from the rear of the engine.

3. To install the camshaft from the rear of the engine, install Tooling (F) on the front of camshaft (8) with Tooling (G).

   Note: Carefully align Tooling (F) with the end of camshaft (8). If the adapter and the camshaft are not aligned, the camshaft may not be removed. The adapter and camshaft bearing will interfere.

4. Install Tooling (E) on Tooling (F).

5. Use two technicians to install the camshaft. Carefully slide the camshaft into the cylinder head from the rear of the engine. Keep the camshaft level while the camshaft is being installed in the cylinder head. The weight of the camshaft is approximately 39 kg (86 lb).

   Note: Rotate the camshaft during installation. This will prevent the camshaft from binding in the camshaft bearings.

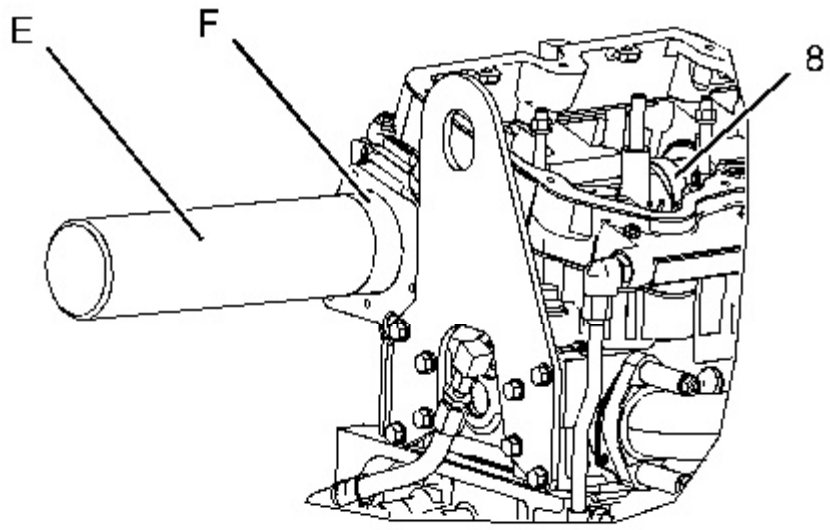

Illustration 9 g01056717

Install the camshaft from the front of the engine.

6. To install the camshaft from the front of the engine, install Tooling (F) on the rear of camshaft (8) with Tooling (G).

   Note: Carefully align Tooling (F) with the end of camshaft (8). If the adapter and the camshaft are not aligned, the camshaft may not be removed. The adapter and camshaft bearing will interfere.

7. Install Tooling (E) on Tooling (F).

8. Use two technicians to install the camshaft. Carefully slide the camshaft into the cylinder head from the front of the engine. Keep the camshaft level while the camshaft is being installed in the cylinder head. The weight of the camshaft is approximately 39 kg (86 lb).

   Note: Rotate the camshaft during installation. This will prevent the camshaft from binding in the camshaft bearings.

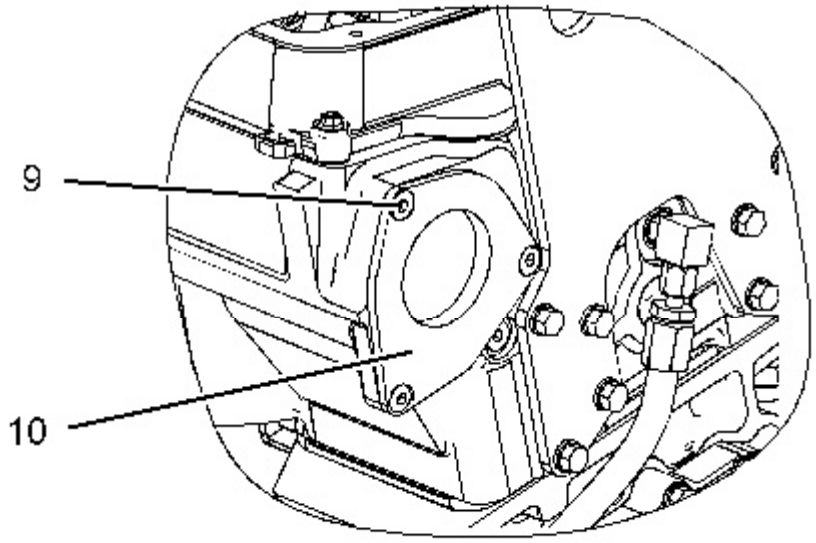

Illustration 10 g01056675

9. Install the O-ring seal on cover (10). Position the cover on the rear of the cylinder head. Install flat head screws (9) and tighten to a torque of 13 ± 3 N·m (10 ± 2 lb ft).

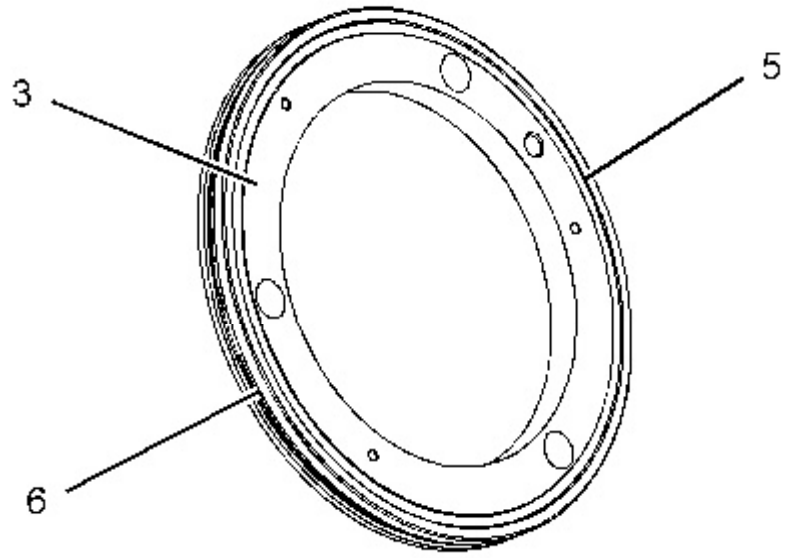

Illustration 11 g01056684

10. Install O-ring seal (5) and O-ring seal (6) in sealing plate (3). Lubricate O-ring seal (6) with a 50/50 mixture of Tooling (J) and clean engine oil.

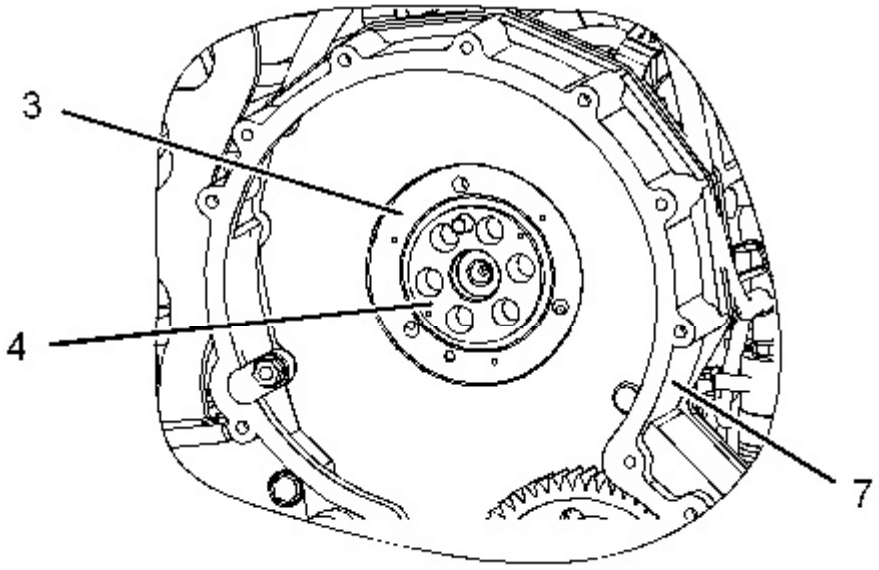

Illustration 12 g01056682

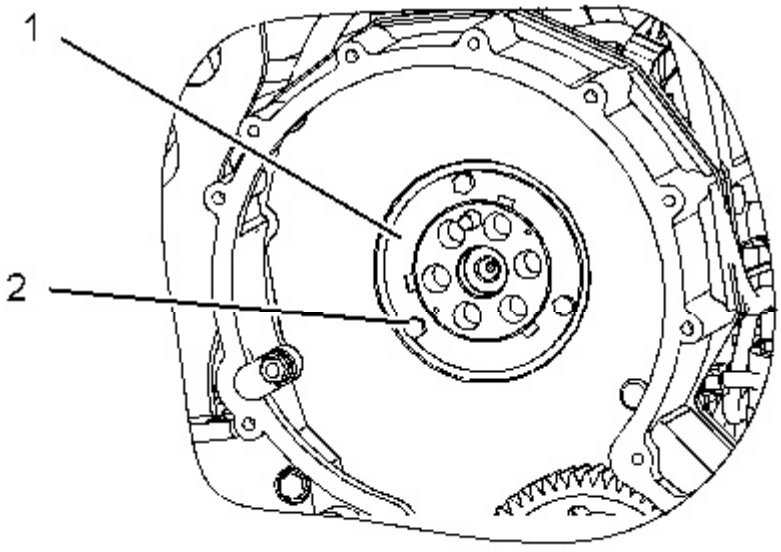

Illustration 13 g01056681

11. Install sealing plate (3) in front housing (7). Install adapter assembly (4) in the sealing plate. Ensure that the dowel in adapter assembly (4) engages the hole in the camshaft.

12. Install thrust plate (1). Apply Tooling (K) to bolts (2). Hold the assembly in position and install bolts (2). Evenly tighten bolts (2) until sealing plate (3) and the O-ring seal are seated against the cylinder head.

    Note: Ensure that the O-ring seal stays in the groove in sealing plate (3).

End By:

a. Install the rocker arms and the rocker shafts. Refer to Disassembly and Assembly, "Rocker Arms and Shaft - Install".

b. Install the camshaft gear. Refer to Disassembly and Assembly, "Camshaft Gear - Remove and Install".

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Product: EXCAVATOR
Model: 385C L EXCAVATOR SBE
Configuration: 385C L Excavator SBE00001-UP (MACHINE) POWERED BY C-18 Engine

Disassembly and Assembly
C15 and C18 Engines for Caterpillar Built Machines
Media Number -RENR8261-23 **Publication Date -01/08/2015** **Date Updated -01/08/2017**

i02211219

Camshaft - Remove

SMCS - 1210-011

Removal Procedure

Table 1

Required Tools			
Tool	**Part Number**	**Part Description**	**Qty**
A	9U-7257	Cradle	1
B	9U-7256	Guide	1
C	9U-7225	Camshaft Pilot	2
D	9U-7240	Camshaft Hook	2

Start By:

a. Remove the camshaft gear. Refer to Disassembly and Assembly, "Camshaft Gear - Remove and Install".

b. Remove the rocker arms and the rocker shafts. Refer to Disassembly and Assembly, "Rocker Arm and Shaft - Remove".

NOTICE

Keep all parts clean from contaminants.

Contaminants may cause rapid wear and shortened component life.

NOTICE

Do not turn the crankshaft or the camshaft while the camshaft gear is removed. If the front gear group is not correctly timed during installation, interference can occur between the pistons and the valves, resulting in damage to the engine.

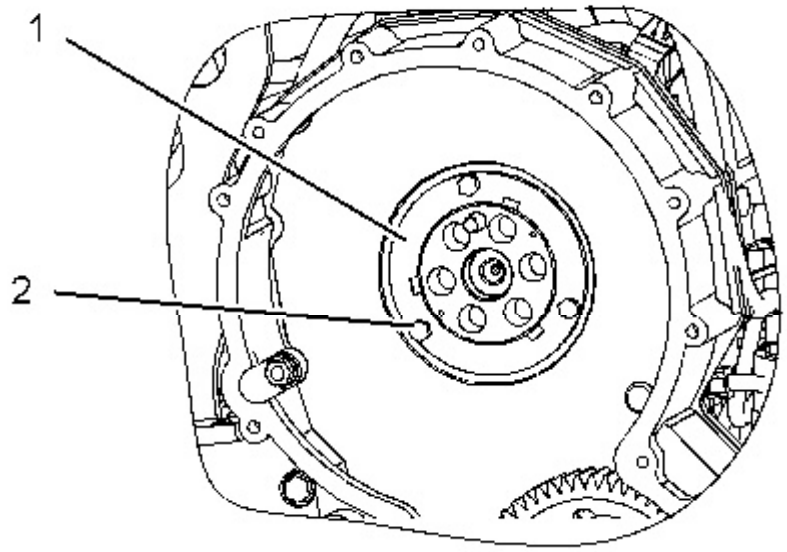

Illustration 1 g01056681

1. Remove bolts (2) and thrust plate (1).

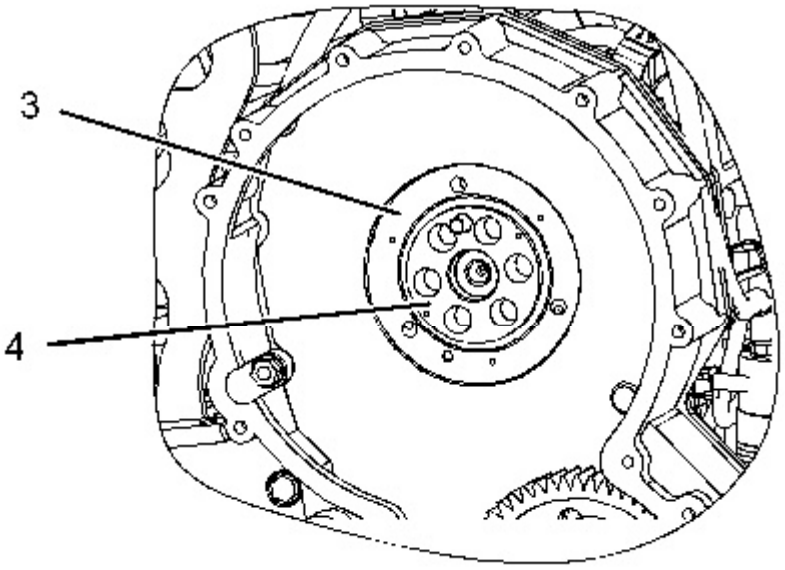

Illustration 2 g01071487

2. Remove sealing plate (3) from the front housing. Remove adapter assembly (4) from the crankshaft.

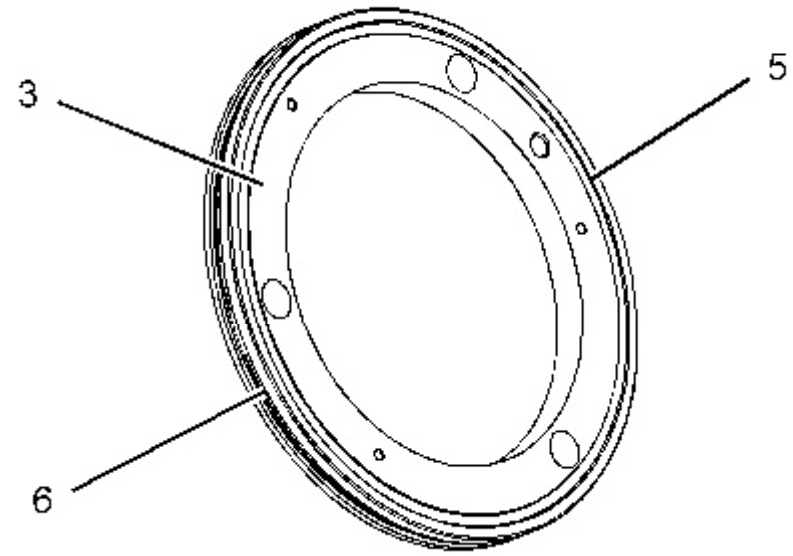

Illustration 3 g01056684

3. Remove O-ring seal (5) and O-ring seal (6) from sealing plate (3).

NOTICE

Care must be used when removing or installing the camshaft. Do not damage the finshed surfaces of the camshaft or the camshaft bearings.

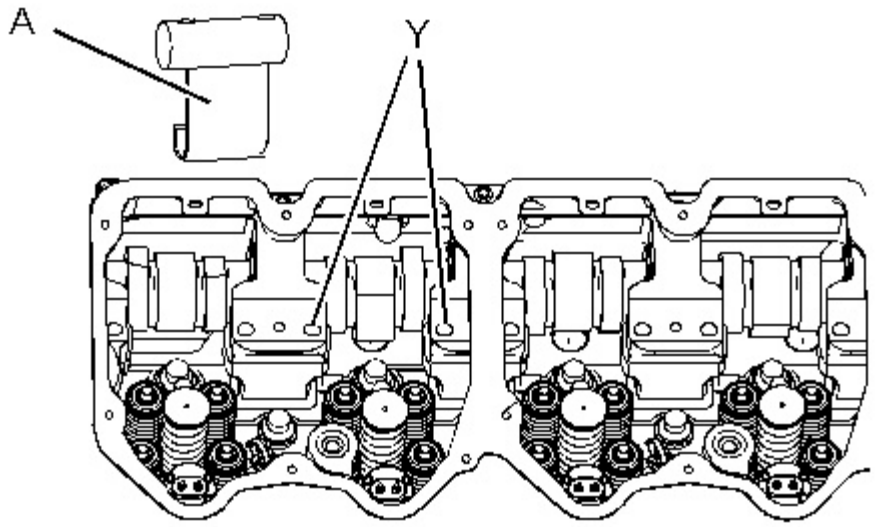

Illustration 4 g01056704

4. Use the bolts for the rocker arm shaft assembly to install Tooling (A) at Location (Y).

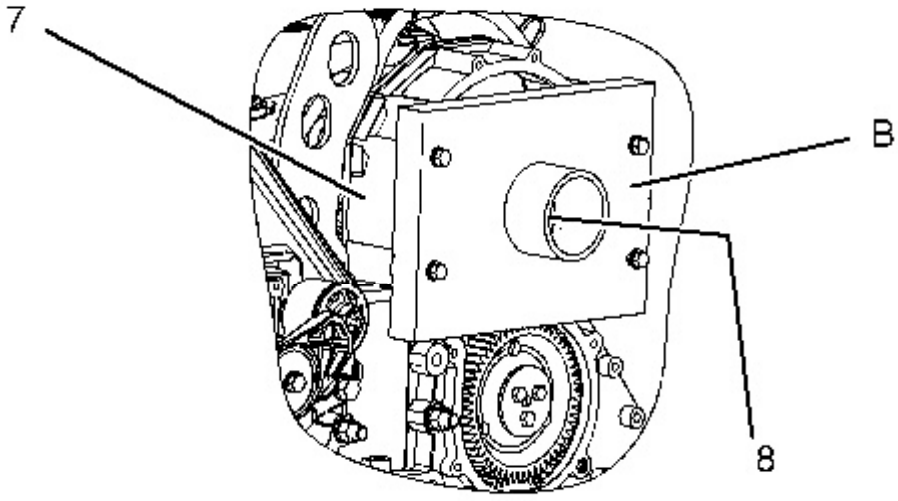

Illustration 5 g01047945

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